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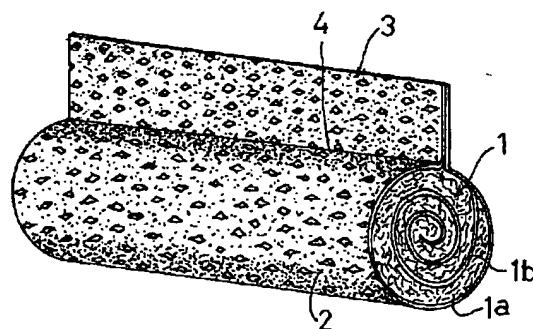
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(54)【発明の名称】 女性用衛生具及びその製造法

(57)【要約】

【課題】外陰部にあてがって使用する立体的小型當て部材であって、単独使用にも、ナプキンとの併用にも適し、装着時、脱着時の便利性があり、しかも使用後の廃棄も容易である女性用衛生具で、経血の吸収用、他の分泌物の処理に適した女性用衛生具およびその製造法を提供する。

【解決手段】水崩壊性及び吸水性を有する材質からなる棒状吸収体を体液浸透性及び水崩壊性を有する表面材で包み込むと共に、該表面材の両端余長部分をつまみ片として残してその基部を止着した構成で、棒状吸収体としては水崩壊性を有する吸水性繊維のシート状芯材を棒状に巻きこんで構成するか、水崩壊性を有する吸水性繊維の補助シート材と共に棒状に巻き込んで構成するのが好ましい。製造法としては上記シート状芯材のみを棒状に巻き込むか、上記補助シート材と共に巻き状態で巻き込んで棒状吸収体を構成し、この棒状吸収体の外側を表面材で包み込み、表面材の両端余長部分の基部を止着してつまみ片を構成する製造法とする。



## 【特許請求の範囲】

【請求項1】 水崩壊性及び吸水性を有する材質からなる棒状吸収体を体液浸透性及び水崩壊性を有する表面材で包み込むとともに、該表面材の両端余長部分をつまみ片として残してその基部を止着してなる女性用衛生具。

【請求項2】 棒状吸収体が水崩壊性を有する吸水性繊維のシート状芯材を棒状に巻き上げてなる請求項1記載の女性用衛生具。

【請求項3】 棒状吸収体が、水崩壊性を有する吸水性繊維の補助シート材と、この補助シート材の上に積層された水崩壊性を有する吸水性繊維のシート状芯材からなり、シート状芯材を内面側として共巻き状態で棒状に巻き込んでなる請求項1記載の女性用衛生具。

【請求項4】 水崩壊性が良好で水分散性を有し、乾燥時にけば立ち、けば抜けのない繊維長6mm以上25mm以下の吸水性繊維を使用した請求項2または3記載の女性用衛生具。

【請求項5】 水崩壊性が良好で水分散性を有し、乾燥時にけば立ち、けば抜けのない繊維長10mm以上15mm以下の吸水性繊維を使用した請求項2または3記載の女性用衛生具。

【請求項6】 水崩壊性を有する吸水性繊維のシート状芯材を棒状に巻き込んで棒状吸収体を構成し、この棒状吸収体の外側を体液浸透性及び水崩壊性を有する表面材で包み、表面材の両端余長部分の基部を止着してつまみ片を構成するようにした女性用衛生具の製造法。

【請求項7】 水崩壊性を有する吸水性繊維のシート状芯材を水崩壊性を有する吸水性繊維の補助シート材上に積層し、シート状芯材を内面側として共巻き状態で巻き込んで棒状吸収体を構成し、この棒状吸収体の外側を体液浸透性及び水崩壊性を有する表面材で包み、表面材の両端余長部分の基部を止着してつまみ片を構成するようにした女性用衛生具の製造法。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】この発明は、経血あるいは体内分泌物の処理のため外陰部に使用する女性用衛生具の改良並びにその製造法に関するものである。

## 【0002】

【従来の技術】従来の生理用品としては、大別して2種類に分けることができる。一つは腔内に挿入するタンポンであり、他方は外陰部にあてがって使用するナプキンの類である。それぞれに一長一短を有し、また使用者の好みによっても使い分けられていた。

【0003】タンポンはその機能からして棒状外観をしており、ナプキンのような当て部材は広がりのある平面的形態を有している。タンポンは腔内に挿入して使用するため女性にとっては抵抗があり、特に国内では普及率も低く20%程度に止まっている。平面的形態を有し、当て部材として使用されるナプキンは、体の動きに

応じて変形する可能性があり、洩れの原因となりやすく、また、直立静止時には経血が真っ直ぐ流下してナプキンに吸収されるが、歩行時、運動時、就寝時には動きに従って経血が流下するため、ナプキンに吸収される前に横方向、後ろ方向へ流失して横洩れ、後ろ洩れが生じる懸念があった。

【0004】実公昭59-11001号では、全体を棒状体とし、最初から使用時の形状とすることにより装着時のずれを防止した棒状月経血吸収具が提供されている。また、特公昭62-42622号、特開昭53-34393号では陰唇間に装着できる衛生パッドとして装着部となる前方部分の断面積を小さく、後方部分の断面積を大きくしたパッド及びその製造方法が開示されている。

【0005】他方、ナプキンの洩れ解消のため、ナプキンに対して別途外陰部に密着可能な補助的當て部材として突出部、棒状体、膨出部を設けたナプキンが種々提供されている。例えば、特公昭60-40295号、実公昭63-23080号、特開平5-115503号、実開平5-62228号、実開平5-41524号、実開平5-18523号等にその例を見ることができる。

## 【0006】

【発明が解決しようとする課題】上記従来例は、単独使用を企図した立体的當て部材か、あるいは平面的當て部材の欠点を補うために外陰部に密着可能な補助的小型の當て部材を一体化した改良形ナプキンに関するものである。しかし、それ自体単独使用可能であるとともに、ナプキンとの併用も可能な立体的小型當て部材は、上記従来例では提供されていなかった。また、立体的小型當て部材においては装着時の便利性が考慮されておらず、使用後の廃棄処分についての考慮もなされていなかったのが現状である。さらにまた、平面的當て部材に対し、補助的小型の當て部材を一体化したタイプにおいては、平面的當て部材を持って當てがうため外陰部に対する補助的小型當て部材の位置決めが困難であった。

【0007】そこで、この発明の目的とするところは、外陰部にあてがって使用する立体的小型當て部材であって、それ単独の使用にも適し、ナプキンとの併用にも適し、また、装着時、脱着時の便利性があり、しかも使用後の廃棄も容易である女性用衛生具で、経血の吸収用としてはもちろん、その他の分泌物の処理にも適した女性用衛生具を提供するところにある。

## 【0008】

【課題を解決するための手段】上記目的達成のため、この発明においては、水崩壊性及び吸水性を有する材質からなる棒状吸収体を体液浸透性及び水崩壊性を有する表面材で包み込むとともに、該表面材の両端余長部分をつまみ片として残してその基部を止着して女性用衛生具としたことを特徴としている。

【0009】棒状吸収体は、水崩壊性を有する吸水性繊

維のシート状芯材のみを棒状に巻き上げて構成しても良く、また、製造上における取扱いの便宜性からいえば水崩壊性を有する吸水性繊維の補助シート材と、この補助シート材の上に積層された水崩壊性を有する吸水性繊維のシート状芯材によって構成され、シート状芯材を内面側として共巻き状態で棒状に巻き込んだ構成とすることもできる。

【0010】ここでいう水崩壊性とは、大量の水または水流中では水解するが、使用時の限定された量の水分においては溶解による素材の破壊が起こらない程度のものをいう。

【0011】水崩壊性を有する吸水性繊維のシート状芯材としては、例えば①CMC、PVA、ポリアクリル酸ソーダあるいはこれらの混合繊維などの水溶性繊維を用いたウェブまたは不織布、②パルプ、コットン等の吸水性天然繊維、レーヨン、アセテート等の吸水性化学繊維、ポリエステル、ポリプロピレン、ポリエチレン、エチレン酢酸ビニル共重合体等に親水性処理を施した吸水性合成繊維を用いたウェブまたは不織布を挙げることができる。後者の場合、水崩壊性が良好なパルプ繊維、レーヨン繊維等においては、そのままウェブとして用いることができる。不織布としては水溶性または親水性のパインダーあるいは水膨潤性ポリマーなどで結合するなど公知の各種水崩壊性不織布が使用可能である。

【0012】水崩壊性を有する吸水性繊維の補助シート材としては、シート状芯材と同様な材質からなる不織布、紙あるいは水溶性のメッシュフィルム等が使用できる。

【0013】また、体液浸透性及び水崩壊性を有する表面材としては、同じく水崩壊性の不織布、紙あるいは水溶性のメッシュフィルム等が使用可能である。

【0014】水崩壊性を有するシート状芯材及び補助シート材は、水解性及び排水とともに容易に排出し得る放流性の高さが望まれるが、このためにはシート状芯材及び補助シート材を構成する繊維素材が水分散性能を有することが望まれる。水崩壊性の良好な繊維素材は水分散性を有するが、水崩壊性を有していても水分散性に乏しい繊維素材においては、繊維長を調整することによって水分散性を具有させることができることである。

【0015】良好な水分散性能を持たせるためには、繊維長を6mm以上25mm以下、好ましくは10mm以上15mm以下程度のものを採用することが望まれる。繊維長が6mm未満においては水崩壊性が良好で、水分散性を有するが、乾燥時においては立ち、けば抜けが起こりやすく、この種当部材としては不適である。また、繊維長が25mmを越えると、水分散性がなくなり水崩壊性が劣るようになり、使用後の処理において不便を生じる。繊維長10mm以上15mm以下程度の繊維素材が水崩壊性、水分散性、製造時の取扱い、また、乾燥時におけるけば立ち、けば抜けの防止の点から好ましい。

【0016】また、製造法としては、水崩壊性を有する吸水性繊維のシート状芯材を棒状に巻き込んで棒状吸収体を構成し、この棒状吸収体の外側を体液浸透性及び水崩壊性を有する表面材で包み、表面材の両端余長部分の基部を止着してつまみ片を構成するか、水崩壊性を有する吸水性繊維のシート状芯材を水崩壊性を有する吸水性繊維の補助シート材上に積層し、シート状芯材を内面側として共巻き状態で巻き込んで棒状吸収体を構成し、この棒状吸収体の外側を体液浸透性及び水崩壊性を有する表面材で包み、表面材の両端余長部分の基部を止着してつまみ片を構成する方法が採用できる。

【0017】上記のように、この発明に係る女性用衛生具は、水崩壊性及び吸水性を有する材質からなる棒状吸収体を体液浸透性及び水崩壊性を有する表面材で包み込むとともに、該表面材の両端余長部分をつまみ片として残してその基部を止着した構成であるので、棒状吸収体部分を小陰唇の内側の凹陥部または小陰唇の間もしくは小陰唇に接触するように大陰唇の間に挟み込んで使用すれば、腔内に異物を挿入することなく経血あるいは分泌物を洩らさずに捕捉して吸収し得るものであり着脱時にはつまみ片を持って処理することができるので便利で衛生的であり、また、水崩壊性を有しているので使用後はトイレに流し得る便宜性を有するものである。

【0018】また、経血の多い場合等にはナプキンと併用することも可能であり、経血を吸収拡散させながらナプキンに橋渡しするので、ナプキン中央部での縦方向の拡散性が向上し、その吸収力を有効利用して横流れ、後ろ流れを防ぐことができる。この場合、ナプキンと一体化したものではないので、直接外陰部に当てがうことができるため位置決めが容易である。

【0019】繊維長6mm以上25mm以下、好ましくは、10mm以上15mm以下の水崩壊性が良好で水分散性を有し、乾燥時における立ち、けば抜けのない吸水性繊維を棒状吸収体の繊維素材として使用すれば、装着時に不快感がなく、また使用後においてトイレに廃棄した時にも水解性に優れ、排水とともに確実・容易に排出し得る利点を有している。

【0020】水崩壊性を有する吸水性繊維の補助シート材の上に、水崩壊性を有する吸水性繊維のシート状芯材を積層し、シート状芯材を内面側として共巻き状態で棒状に巻き込んで棒状吸収体とした場合、製造が容易で、形崩れの無い製品を提供できる。また、請求項7または8に従った製造法によれば品質の良い製品を容易に製造することができる。

【0021】

【発明の実施の形態】以下、図面を参照してこの発明に係る女性用衛生具の実施の形態について説明する。図1ないし図4は、この発明に係る女性用衛生具の一例を示すもので、水崩壊性及び吸水性を有する材質からなる棒状吸収体1と、この棒状吸収体を包みこんだ体液浸透性

及び水崩壊性を有する表面材2と、表面材2の両端余長部分によって構成されるつまみ片3とによって構成されている。

【0022】この例においては、棒状吸収体1は、水崩壊性を有する吸水性繊維の補助シート材1bと、この補助シート材1bの上に積層された水崩壊性を有する吸水性繊維のシート状芯材1aからなり、シート状芯材1aを内面側として共巻き状態で棒状に巻き込んだ構成を採用している。シート状芯材1aは、レーヨンステーブルのウェブ、補助シート材1bは素材繊維としてレーヨンステーブル85.5~95.0%、結合剤としてポリビニールアルコール14.5~5.0%の範囲で混合して抄造した不織布を用いている。また、水崩壊性及び易放流性を高めるとともに乾燥時のはば立ち、けば抜けを防止するため、繊維長は6mm以上25mm以下、好ましくは10mm以上15mm以下の範囲内のものとする。

【0023】全体の大きさとしては、外陰部に対応した適宜の長手方向寸法と外径とを有するものとし、一般的には、棒状吸収体1の外径は15mm、長手方向寸法は45mm程度とする。

【0024】表面材2は、補助シート材1bと同様の水崩壊性不織布を用い、棒状吸収体1の外面を包み込むとともに、両端余長部分をつまみ片3として残して、その基部4において棒状吸収体1の長手方向に沿って接着剤により止着したものである。このような女性用衛生具は次の製法によって極めて容易に製造可能である。すなわち、繊維長6mm以上25mm以下の水崩壊性が良好で乾燥時にけば立ち、けば抜けのないレーヨンステーブルのウェブをシート状芯材1aとして、水崩壊性を有する不織布

実験例	1	2	3	4	5	6	7	8	9
重量(g)									
吸収前	0.70	0.70	0.68	0.69	0.69	0.68	0.70	0.67	0.68
吸収後	8.85	8.85	8.89	9.12	9.12	8.75	8.79	8.72	8.71
吸収量	8.15	8.15	8.21	8.43	8.43	8.07	8.09	8.05	8.03
吸収量/吸収前重量	11.6	11.6	12.1	12.2	12.2	11.9	11.6	12.0	11.8

経血量は月経2日目の量が最も多く、その日別経血量は約30gと報告されている。歩行時、運動時、就寝時には体の動きに伴い、経血がナプキン表面を流れやすくなると考えられるので、ナプキンを横方向に45°の角度に固定した。模擬経血の量は、経血量が中程度の人から多い人が長時間使用したり、一度に多量の経血が流れた時を想定して20mlとした。

【0029】図5で示すように、アクリル板5上でナプキン6を横方向に45°の角度に固定し、ナプキン中央部(クロッチ部分)に5mm上から模擬経血をピュレット7で20ml流下し、流れ洩れ状態を観察した。また、あらかじめ重量を測定しておいた洩れ吸収用不織布(キノクロス)8に吸収された量を測定した。

※

## [成分]

蒸留水

2,457.0 g

## [性状]

pH 7.3

\* 布製の補助シート材1b上に積層し、シート状芯材1aを内面側として共巻き状態で巻き込んで棒状吸収体1を構成し、この棒状吸収体1の外側を体液浸透性及び水崩壊性を有する不織布製の表面材2で包み、表面材2の両端余長部分の基部4を接着してつまみ片3を構成すれば良い。

【0025】もちろん、棒状吸収体1、表面材2及びつまみ片3の素材並びに棒状吸収体1及び表面材2の構成は上記に限定されるものではなく、この発明の技術的思想として開示した前述の範囲内において適宜の実施形態を取り得ることはいうまでもない。

【0026】本発明に係る女性用衛生具は、それ自体外陰部にあってがって使用する立体的小型當て部材であって、単独使用によって経血の吸収、分泌物の処理に適しているのはもちろん、ナプキンとの併用にも適している。本発明品の吸水性能およびナプキンと併用した場合の経血吸収性能について下記条件で試験を行った。

【0027】衛生具の構成は、繊維長15mmのレーヨンステーブルのウェブをシート状芯材として用い、レーヨンステーブル85%、結合剤としてポリビニールアルコール15%の範囲で混合して抄造した不織布を、共巻き用の補助シート材及び表面材の不織布として用いた。棒状吸収体の外径は15mm、長手方向寸法は45mm、つまみ片の長さ(突出度)は15mmとした。一個当りの重量は0.68gである。表1は上記構成に係る本発明品の吸水性能を示す。

【0028】

【表1】

※【0030】また、アクリル板5上でナプキン6を横方向に45°の角度に固定し、ナプキン中央部(クロッチ部分)に本発明に係る衛生具Aを載せ、5mm上から模擬経血をピュレット7で20ml流下し、流れ洩れ状態を観察した。また、あらかじめ重量を測定しておいた洩れ吸収用不織布(キノクロス)8に吸収された量を測定した。また、ナプキン中央部に沿って長手方向への拡散状態を調べ、縦拡散長として表した。

【0031】洩れ吸収用不織布における吸収量が多いほど洩れの多いことを示し、縦拡散長が長いほど吸収拡散状態が良好であることを示す。

【0032】模擬経血の成分・性状は次の通り。

【0033】

塩化ナトリウム	20.7 g	粘度 13.8 cP (23°C、B型粘度計)
塩化カリウム	1.0 g	
塩化カルシウム	1.9 g	
炭酸水素ナトリウム	0.3 g	
ポリビニルピロリドン	50.0 g	
ブルロニック	1.3 g	
食用色素 青色1号	適量g	

上記試験結果を表2に示す。

\* [表2]

[0034]

\*

ナプキンNo.	A				B				C				D				
	1	2	3	平均													
ナプキン質量(g)																	
吸収前	5.29	5.62	5.70	5.54	6.93	6.49	5.73	5.72	3.45	3.51	3.43	3.46	3.63	3.75	3.68	3.69	
吸収後	25.27	25.60	25.52	25.46	19.05	18.41	18.44	18.63	14.52	16.38	16.39	15.75	16.38	16.82	16.42	16.41	
吸収量	19.98	19.98	19.82	19.93	13.12	12.92	12.71	12.92	11.07	12.82	12.96	12.28	12.75	12.87	12.74	12.79	
発明品質量(g)																	
吸収前	-	-	-	-	0.71	0.69	0.67	0.69	-	-	-	-	0.69	0.70	0.71	0.70	
吸収後	-	-	-	-	7.60	7.76	7.98	7.71	-	-	-	-	8.03	7.92	7.83	7.93	
吸収量	-	-	-	-	6.89	7.01	7.29	7.08	-	-	-	-	7.34	7.22	7.12	7.23	
換れ吸収用不織布 質量(g)																	
吸収前	2.79	2.81	2.76	2.79	2.83	2.83	2.83	2.83	2.82	2.79	2.86	2.82	2.85	2.83	2.91	2.86	
吸収後	2.83	2.86	2.79	2.79	2.83	2.83	2.83	2.83	2.83	2.83	2.85	2.85	2.83	2.91	2.86	2.86	
吸収量	0.04	0.05	0.03	0	0	0	0	0	8.63	7.16	5.89	7.53	0.00	0.00	0.00	0.00	
吸収量合計(%)	20.02	20.03	19.85	19.97	20.01	19.99	20.00	20.00	19.60	19.88	19.85	19.81	20.09	20.09	19.86	20.01	
ナプキン吸収率(%)	99.80	99.75	99.89	99.80	65.57	64.63	63.55	64.58	58.48	64.16	65.29	61.98	63.46	64.06	64.15	62.89	
本発明品吸収率(%)	-	-	-	-	34.43	35.37	35.45	35.42	-	-	-	-	35.54	35.94	35.35	35.11	
汚れ率(%)	0.20	0.25	0.15	0.20	0.00	0.00	0.00	0.00	43.52	35.84	34.71	38.02	0.00	0.00	0.00	0.00	
織維長( mm ) ナプキンのみ 本発明品併用	58	57	55	57	-75	-71	-74	-78	58	60	61	60	-77	-76	-80	-78	

なおまた、レーヨンステープルを例にとり、その繊維長と分散性及びけばの発生状態との関係をテストした。

[0035] 分散性試験は、2リットルの水にサンプルを0.2gとり、攪拌式洗浄力試験機にて100rpm・5分の攪拌を行い、ふるい(Mesh No.4)でくぐりて濾過し105°C、20分の乾燥を行って重量を測定し、次式にしたがって分散率を求めた。その結果を表3に示す。繊維長が短いほど分散率が上がることが分かる。

[0036] 分散率(%) = (A - B) / B × 100  
A…サンプル量 B…メッシュ残留量

[表3]

繊維長( mm )	分散率( % )
5	7.5. 0.3
10	5.9. 0.5
20	3.7. 2.0
25	3.1. 8.0
30	2.9. 4.6

けば抜け試験は、製品をチャック付ポリ袋に入れ、振幅30cmで30回振った後、チャック付ポリ袋から製品を取り出して残留するけばを観察した。その結果を表4に示す。繊維長5mm以下はけばが多く好ましくない。

[0037]

[表4]

繊維長( mm )	評 価
5	ケバ多く気になる X
10	ややあるが気にならない △
15	ややあるが気にならない △
20	ややあるが気にならない △
25	あまりない ○
30	あまりない ○

上記分散性及びけば抜け試験の結果から、レーヨンステープルにおいては、繊維長は6mm以上25mm以下が好ましく、さらに好ましくは10mm以上15mm以下といえる。

[0038]

【発明の効果】以上詳述したところから明らかに、この発明に係る女性用衛生具は、外陰部にあてがって使用する立体の小型当て部材であって、それ自体良好な吸水性能を有しており、単独使用によっても経血、その他の分泌物の処理に適する外、ナプキンと併用した場合には経血量が多いときにも、かつ歩行時、運動時、就寝時などにおいてもナプキンと外陰部との間に空間を生じさせず、経血を吸収拡散してナプキンに有効に橋渡しするので横洩れ、後ろ洩れを有效地に防止することができる。また、ナプキンと一体化されていないので、装着時に外陰部に対する位置決めが容易である。

【0039】また、つまみ片を有しているので装着時、脱着時に衛生的で便利であり、かつ水崩壊性を有するので使用後はトイレに流し得るので廃棄も容易であるとい

う利点も有している。また、水崩壊性を有する吸水性繊維のシート状芯材を棒状に巻き込んで棒状吸収体を構成するか、水崩壊性を有する吸水性繊維のシート状芯材を水崩壊性を有する吸水性繊維の補助シート材上に積層し、共巻き状態で巻き込んで棒状吸収体を構成し、この棒状吸収体の外側を体液浸透性及び水崩壊性を有する表面材で包み、表面材の両端余長部分の基部を止着してつまみ片を構成する製造法によれば、着脱に便利で衛生的で吸収性能が良く、廃棄時にも便利な衛生具を容易に製造することができる。

## 【図面の簡単な説明】

【図1】この発明に係る女性用衛生具の一実施例を示す斜視図

\* 【図2】同正面図

【図3】同側面図

【図4】同中央縦断面図

【図5】同衛生具の経血吸収性能試験の実施状況を示す概略斜視図

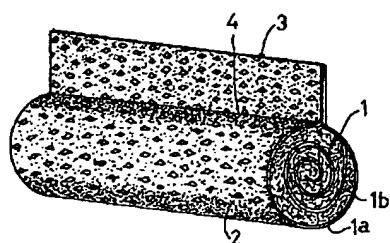
## 【符号の説明】

1 ……棒状吸収体      1 a ……シート状芯材  
1 b ……補助シート材      2 ……表面材      3 ……つま  
み片

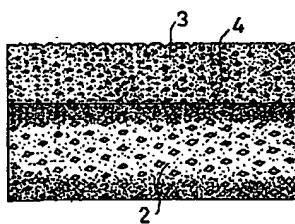
10 4 ……基部      5 ……アクリル板      6 ……ナプキン  
7 ……ビュレット      8 ……汚れ吸收用不織布（キノク  
ロス）

\* A ……衛生具

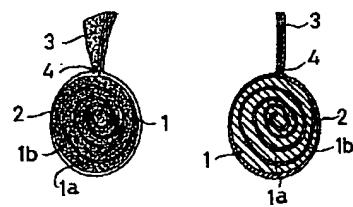
【図1】



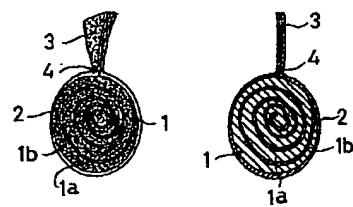
【図2】



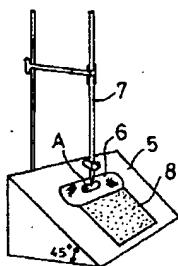
【図3】



【図4】



【図5】



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**Bibliography**

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13/15  
[FI]  
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13/18 340  
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Epitome

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(57) [Abstract]

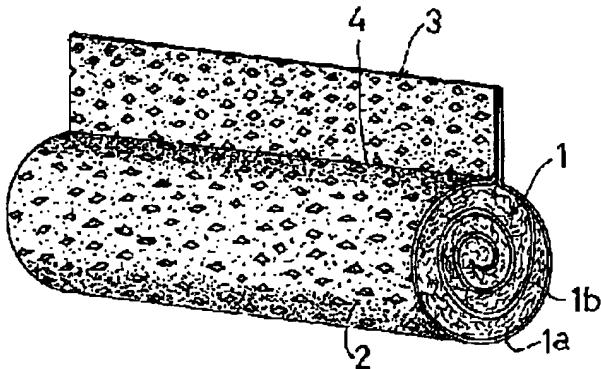
[Technical problem] It is the three-dimensional small reliance member used assigning the vulva, and it is suitable for independent use and concomitant use with a napkin, and there is convenience at the time of desorption at the time of wearing, and the sanitary device for women to which the abandonment after use was moreover also suitable for processing of the object for absorption of menstrual blood and other secrete by the easy sanitary device for women, and its manufacturing method are offered.

[Means for Solution] It is desirable to involve in in the shape of a rod and to constitute with auxiliary-seat material of absorptivity fiber which involves in a sheet-like core material of absorptivity fiber which has water collapsibility as a cylindrical absorber in the shape of a rod, and constitutes it from a configuration which left a both-ends extra length portion of this facing as a tongue piece, and attached the base firmly, or has water collapsibility, while wrapping a cylindrical absorber which consists of the quality of the material which has water collapsibility and absorptivity in facing which has body-fluid permeability and water collapsibility. It considers as a manufacturing method which involves in only the above-mentioned sheet-like core material in the shape of a rod as a manufacturing method, or involves in in the state of the above-mentioned auxiliary-seat material and \*\*\*\*\*, constitutes a cylindrical absorber, wraps an outside of this cylindrical absorber in

facing, attaches firmly a base of a both-ends extra length portion of facing, and constitutes a tongue piece.

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[Translation done.]



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CLAIMS

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[Claim(s)]

[Claim 1] A sanitary device for women which leaves a both-ends extra length portion of this facing as a tongue piece, and comes to attach the base firmly while wrapping a cylindrical absorber which consists of the quality of the material which has water collapsibility and absorptivity in facing which has body fluid permeability and water collapsibility.

[Claim 2] A sanitary device for women according to claim 1 to which a cylindrical absorber comes to wind up a sheet-like core material of absorptivity fiber which has water collapsibility in the shape of a rod.

[Claim 3] A sanitary device for women according to claim 1 which a cylindrical absorber consists of auxiliary-seat material of absorptivity fiber which has water

collapsibility, and a sheet-like core material of absorptivity fiber which has water collapsibility by which the laminating was carried out on this auxiliary-seat material, and it comes to involve in in the shape of a rod in the state of \*\*\*\*\* by making a sheet-like core material into an inside side.

[Claim 4] A sanitary device for women according to claim 2 or 3 which used with a 6mm or more 25mm or less fiber length which water collapsibility is good, has water-dispersion, becomes fluffy at the time of desiccation, and does not have a \*\*\*\* omission absorptivity fiber.

[Claim 5] A sanitary device for women according to claim 2 or 3 which used with a 10mm or more 15mm or less fiber length which water collapsibility is good, has water-dispersion, becomes fluffy at the time of desiccation, and does not have a \*\*\*\* omission absorptivity fiber.

[Claim 6] A manufacturing method of a sanitary device for women which involved in a sheet-like core material of absorptivity fiber which has water collapsibility in the shape of a rod, constituted a cylindrical absorber, attaches firmly a base of a package and a both-ends extra length portion of facing by facing which has body fluid permeability and water collapsibility for an outside of this cylindrical absorber, and constituted a tongue piece.

[Claim 7] A manufacturing method of a sanitary device for women which carried out the laminating of the sheet-like core material of absorptivity fiber which has water collapsibility on auxiliary-seat material of absorptivity fiber which has water collapsibility, involved in in the state of \*\*\*\*\* by having made a sheet-like core material into an inside side, constituted a cylindrical absorber, attaches firmly a base of a package and a both-ends extra length portion of facing by facing which has body fluid permeability and water collapsibility for an outside of this cylindrical absorber, and constituted a tongue piece.

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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]****[0001]**

[The technical field to which invention belongs] This invention relates to that manufacturing method at the amelioration list of the sanitary device for women used for the vulva for processing of menstrual blood or secrete in the living body.

**[0002]**

[Description of the Prior Art] As conventional sanitary items, it can divide roughly and can divide into two kinds. One is a tampon inserted into a vagina and another side is the kind of the napkin used assigning the vulva. It has merits and demerits in each, and was properly used by liking of a user.

[0003] The tampon has cylindrical appearance, considering the function, and a reliance member like a napkin has the superficial gestalt with breadth. In order to use a tampon, inserting into a vagina, for the woman, it has resistance, and a diffusion rate is also especially low at home, and it has stopped to about 20%. Although the napkin which has a superficial gestalt and is used as a reliance member may deform according to a motion of the body, and it is easy to become the cause of a leak, and menstrual blood carries out straight flowing down at the time of erection quiescence and it is absorbed by the napkin. Since menstrual blood flowed down according to a motion at the time of sleeping at the time of movement at the time of a walk, before being absorbed by the napkin, the concern which is spilt out in a longitudinal direction and the direction of back, and a horizontal leak and a back leak produce was.

[0004] In JP,59-11001,Y, the cylindrical menstrual blood absorption implement which prevented the gap at the time of wearing is offered by making the whole into a rod-like structure and considering as the configuration of the condition at the time of use from the beginning. Moreover, in JP,62-42622,B and JP,53-34393,A, it is small in the cross section of the front portion which serves as an applied part as a health pad with which it can equip between labia pudendi, and the pad which enlarged the cross section of a back portion, and its manufacture method are indicated.

[0005] On the other hand, the napkin which prepared a lobe, a rod-like structure, and the swelling section to the napkin as an auxiliary reliance member which can be separately stuck to the vulva is variously offered for the leak dissolution of a napkin. For example, the example can be seen to JP,60-40295,B, JP,63-23080,Y, JP,5-115503,A, JP,5-62228,U, JP,5-41524,U, JP,5-18523,U, etc.

**[0006]**

[Problem(s) to be Solved by the Invention] The above-mentioned conventional example is related with the modification napkin which unified the auxiliary small reliance member which can be stuck to the vulva, in order to compensate the defect of the three-dimensional reliance member which planned independent use, or a superficial reliance member. however, independent in itself — while it was usable, the three-dimensional small reliance member in which concomitant use with a napkin is also possible was not offered in the above-mentioned conventional example.

Moreover, the present condition is that the convenience at the time of wearing was not taken into consideration in the three-dimensional small reliance member, and the consideration about the disposal after use was not made, either. the type which unified the auxiliary small reliance member to the superficial reliance member further again — setting — a superficial reliance member — having — reliance — obtaining — a sake — the vulva — receiving — auxiliary — small — positioning of a reliance member was difficult.

[0007] Then, the place made into the purpose of this invention is a three-dimensional small reliance member used assigning the vulva. It is suitable also for its independent use, and is suitable also for concomitant use with a napkin, and there is convenience at the time of desorption at the time of wearing, and, moreover, of course, the place which offers the sanitary device for women also suitable for processing of other secrete also has the abandonment after use as an object for absorption of menstrual blood by the easy sanitary device for women.

[0008]

[Means for Solving the Problem] While wrapping a cylindrical absorber which consists of the quality of the material which has water collapsibility and absorptivity in this invention for the above-mentioned purpose achievement in facing which has body fluid permeability and water collapsibility, it is characterized by having left a both-ends extra length portion of this facing as a tongue piece, having attached that base firmly, and considering as a sanitary device for women.

[0009] Auxiliary-seat material of absorptivity fiber which has water collapsibility if a cylindrical absorber may wind up only a sheet-like core material of absorptivity fiber which has water collapsibility in the shape of a rod, and may constitute it and it says from the expedient nature of handling on manufacture, It is constituted by sheet-like core material of absorptivity fiber which has water collapsibility by which the laminating was carried out on this auxiliary-seat material, and can also consider as a configuration involved in in the shape of a rod in the state of \*\*\*\*\* by making a sheet-like core material into an inside side.

[0010] Although hydration of the water collapsibility here is carried out in a lot of water or streams, it means what is the degree to which destruction of a material by dissolution does not take place in moisture of an amount to which it was limited at the time of use.

[0011] as the sheet-like core material of absorptivity fiber which has water collapsibility — \*\* — a web or a nonwoven fabric using an absorptivity synthetic fiber which performed hydrophilic processing can be mentioned to absorptivity chemical fibers, such as absorptivity natural fibers, such as a web or a nonwoven fabric using soluble fibers, such as CMC, PVA, sodium polyacrylate, or these mixed fiber, \*\* pulp, and a cotton, rayon, and acetate, polyester, polypropylene, polyethylene, an ethylene-vinyl acetate copolymer, etc. In the case of the latter, water collapsibility can use as a web as it is in good pulp fiber, a rayon fiber, etc. Various well-known water collapsibility nonwoven fabrics, such as joining together as

a nonwoven fabric by a binder or water-bloating tendency polymer of water solubility or hydrophilicity etc., are usable.

[0012] A nonwoven fabric, paper, or a water-soluble mesh film etc. which consists of the same quality of the material as a sheet-like core material as auxiliary-seat material of absorptivity fiber which has water collapsibility can be used.

[0013] Moreover, similarly as facing which has body fluid permeability and water collapsibility, a nonwoven fabric, paper, or a water-soluble mesh film of water collapsibility etc. is usable.

[0014] Fibrin material which for that constitutes a sheet-like core material and auxiliary-seat material is wanted to have water-dispersion ability, although height of discharge nature which can discharge easily a sheet-like core material and auxiliary-seat material which have water collapsibility with hydration nature and wastewater is desired. Although good fibrin material of water collapsibility has water-dispersion, even if it has water collapsibility, to make water-dispersion possess is desired by adjusting fiber length to water-dispersion in scarce fibrin material.

[0015] In order to give good water-dispersion ability, to adopt a thing of 10mm or more 15mm or less degree preferably is desired 6mm or more 25mm or less in fiber length. Fiber length becomes fluffy at the time of desiccation, although water collapsibility is good and has water-dispersion in less than 6mm, a \*\*\*\* omission tends to happen, and it is unsuitable as this seed reliance member. Moreover, if fiber length exceeds 25mm, water-dispersion will be lost, water collapsibility will come to be inferior, and inconvenience will be produced in processing after use. Fibrin material of a fiber length a 10mm or more 15mm or less degree is desirable from water collapsibility, water-dispersion, handling at the time of manufacture and fluff at the time of desiccation, and a point of prevention of a \*\*\*\* omission.

[0016] Moreover, as a manufacturing method, involve in a sheet-like core material of absorptivity fiber which has water collapsibility in the shape of a rod, and a cylindrical absorber is constituted. An outside of this cylindrical absorber by facing which has body fluid permeability and water collapsibility A package, The laminating of the sheet-like core material of absorptivity fiber which attaches firmly a base of a both-ends extra length portion of facing, and constitutes a tongue piece, or has water collapsibility is carried out on auxiliary-seat material of absorptivity fiber which has water collapsibility. A method of involving in in the state of \*\*\*\*\* by making a sheet-like core material into an inside side, and constituting a cylindrical absorber, and attaching firmly a base of a package and a both-ends extra length portion of facing by facing which has body fluid permeability and water collapsibility for an outside of this cylindrical absorber, and constituting a tongue piece is employable.

[0017] As mentioned above, a sanitary device for women concerning this invention While wrapping a cylindrical absorber which consists of the quality of the material which has water collapsibility and absorptivity in facing which has body fluid permeability and water collapsibility Since it is the configuration which left a both-

ends extra length portion of this facing as a tongue piece, and attached the base firmly If it is used putting a cylindrical absorber portion between labium majus so that between a cavity inside labia minora or labia minora or labia minora may be contacted Since it catches without leaking menstrual blood or secrete, it may absorb and it can process with a tongue piece at the time of attachment and detachment, without inserting a foreign matter into a vagina, it is convenient and sanitary, and since it has water collapsibility, after use has expedient nature which can be passed to a toilet.

[0018] Moreover, when there is much menstrual blood, using together with a napkin is also possible, since pons delivery is carried out to a napkin, carrying out absorption diffusion of the menstrual blood, the diffusibility of a lengthwise direction in a napkin center section improves, the absorptive power is used effectively, and \*\*\*\*\* can perform a horizontal leak and a back leak. in this case, since it is not what was united with a napkin, and reliance obtains to direct vulva and things are made to it, positioning is easy.

[0019] Also when water collapsibility 10mm or more 15mm or less is good, and has water-dispersion preferably 6mm or more 25mm or less fiber length, and it becomes fluffy at the time of desiccation, there will be no displeasure at the time of wearing if absorptivity fiber without a \*\*\*\* omission is used as fibrin material of a cylindrical absorber, and it discards to a toilet after use, it excels in hydration nature, and it has an advantage which can be discharged certainly and easily with wastewater.

[0020] When the laminating of the sheet-like core material of absorptivity fiber which has water collapsibility was carried out, and it involves in in the shape of a rod in the state of \*\*\*\*\* and considers as a cylindrical absorber by making a sheet-like core material into an inside side on auxiliary-seat material of absorptivity fiber which has water collapsibility, manufacture is easy and a product without form collapse can be offered. Moreover, according to the manufacturing method according to claims 7 or 8, a quality product can be manufactured easily.

[0021]

[Embodiment of the Invention] Hereafter, the gestalt of operation of the sanitary device for women which starts this invention with reference to a drawing is explained. Drawing 1 thru/or drawing 4 show an example of the sanitary device for women concerning this invention, and is constituted by the cylindrical absorber 1 which consists of the quality of the material which has water collapsibility and absorptivity, the facing 2 which has the body fluid permeability and water collapsibility which wrapped in this cylindrical absorber, and the tongue piece 3 constituted by the both-ends extra length portion of facing 2.

[0022] In this example, the cylindrical absorber 1 consisted of sheet-like core material 1a of absorptivity fiber which has the water collapsibility by which the laminating was carried out on auxiliary-seat material 1b of absorptivity fiber which has water collapsibility, and this auxiliary-seat material 1b, and the configuration involved in in the shape of a rod in the state of \*\*\*\*\* by making sheet-like core

material 1a into an inside side is used for it. The nonwoven fabric which was mixed in the range of 14.5 – 5.0% of poly vinyl alcohol, and milled paper is used for sheet-like core material 1a by the web of a rayon staple, and auxiliary-seat material 1b as 85.5 – 95.0% of rayon staples, and a binder as material fiber. Moreover, in order to stand if it goes away at the time of desiccation while raising water collapsibility and \*\*\*\*\*\*, and to prevent a \*\*\*\* omission, let fiber length preferably be the thing of 10mm or more 15mm or less within the limits 6mm or more 25mm or less.

[0023] As the whole magnitude, it shall have the proper longitudinal direction size and proper outer diameter corresponding to the vulva, and, generally the outer diameter of the cylindrical absorber 1 sets 15mm and a longitudinal direction size to about 45mm.

[0024] Facing 2 leaves a both-ends extra length portion as a tongue piece 3, and attaches it firmly with adhesives along with the longitudinal direction of the cylindrical absorber 1 in the base 4 while it wraps in the external surface of the cylindrical absorber 1 using the same water collapsibility nonwoven fabric as auxiliary-seat material 1b. Such a sanitary device for women can be manufactured very easily by the following process. Namely, with a 6mm or more 25mm or less fiber length water collapsibility is good, and becomes fluffy at the time of desiccation, and the web of a rayon staple without a \*\*\*\* omission is set to sheet-like core material 1a. Carry out a laminating on auxiliary-seat material 1b made of a nonwoven fabric which has water collapsibility, involve in in the state of \*\*\*\*\* by making sheet-like core material 1a into an inside side, and the cylindrical absorber 1 is constituted. What is necessary is to paste up the base 4 of a package and the both-ends extra length portion of facing 2 by the facing 2 made of a nonwoven fabric which has body fluid permeability and water collapsibility for the outside of this cylindrical absorber 1, and just to constitute the tongue piece 3.

[0025] Of course, it cannot be overemphasized that a proper operation gestalt can be taken within the limits of the above-mentioned which the configuration of the cylindrical absorber 1 and facing 2 is not limited above to the material list of the cylindrical absorber 1, facing 2, and the tongue piece 3, and was indicated as technical thought of this invention.

[0026] The sanitary device for women concerning this invention is a three-dimensional small reliance member used in itself, assigning the vulva, and is suitable also for concomitant use with a napkin as well as being suitable for absorption of menstrual blood, and processing of secrete with independent use. It examined on the following conditions about the menstrual blood absorptivity ability at the time of using together with the absorptivity ability of this invention article, and a napkin.

[0027] The configuration of a sanitary device used the nonwoven fabric which mixed and milled paper in poly vinyl alcohol 15% as a binder as a nonwoven fabric of the auxiliary-seat material for \*\*\*\*\*\*, and facing rayon staple 85%, using the web of a rayon staple with a fiber length of 15mm as a sheet-like core material. In the outer diameter of a cylindrical absorber, 15mm and a longitudinal direction size set the

length (whenever [ protrusion ]) of 45mm and a tongue piece to 15mm. The weight per piece is 0.68g. A table 1 shows the absorptivity ability of this invention article concerning the above-mentioned configuration.

[0028]

[A table 1]

実施例	1	2	3	4	5	6	7	8	9
重量(㌘)									
吸収前	0.70	0.70	0.88	0.89	0.89	0.88	0.70	0.67	0.68
吸収後	8.85	8.85	8.89	9.12	9.12	8.75	8.79	8.72	8.71
吸収量	8.15	8.15	8.21	8.43	8.43	8.07	8.09	8.05	8.03
吸収量/吸収前重量	11.6	11.6	12.1	12.2	12.2	11.9	11.6	12.0	11.8

Menstrual blood loss has most day [ of menstruation / 2nd ] amounts, and it is reported that the Japanese another menstrual blood loss is about 30g. Since it was thought in connection with the motion of the body at the time of sleeping at the time of movement at the time of a walk that menstrual blood became easy to flow the napkin surface, the napkin was fixed to the angle of 45 degrees in the longitudinal direction. Many persons from those whose menstrual blood loss is whenever [ middle ] used the amount of simulation menstrual blood for a long time, and it was set to 20ml supposing the time of a lot of menstrual blood flowing at once.

[0029] As drawing 5 showed, the napkin 6 was fixed to the angle of 45 degrees in the longitudinal direction on the acrylic board 5, it flowed down 20ml of simulation menstrual blood with the buret 7 from on 5mm in the napkin center section (KUROTCHI portion), and the flow leak condition was observed. Moreover, the amount which measured weight beforehand and which leaked and was absorbed by the nonwoven fabric 8 for absorption (kino crossing) was measured.

[0030] Moreover, the napkin 6 was fixed to the angle of 45 degrees in the longitudinal direction on the acrylic board 5, the sanitary device A concerning this invention was put on the napkin center section (KUROTCHI portion), it flowed down 20ml of simulation menstrual blood with the buret 7 from on 5mm, and the flow leak condition was observed. Moreover, the amount which measured weight beforehand and which leaked and was absorbed by the nonwoven fabric 8 for absorption (kino crossing) was measured. Moreover, the diffusion condition to a longitudinal direction was investigated along the napkin center section, and it expressed as vertical diffusion length.

[0031] It is shown that there are so many leaks that there are many absorbed amounts in the nonwoven fabric for leak absorption, and it is shown that an absorption diffusion condition is so good that vertical diffusion length is long.

[0032] The component and description of simulation menstrual blood are as follows.

[0033]

[Component] [Description] Distilled water 2,457.0 g pH 7.3 Sodium chloride 20.7 g Viscosity 13.8cp Potassium chloride 1.0 g (23 degrees C, Brookfield viscometer) Calcium chloride 1.9 g Sodium hydrogencarbonate 0.3 g Polyvinyl pyrrolidone 50.0 g

Pluronic 1.3 g Food color Blue No. 1 Optimum dose g The above-mentioned test result is shown in a table 2.

[0034]

[A table 2]

ナフキンNo.	A				B				C				D			
	1	2	3	平均												
ナフキン重量(g)	5.29	5.62	5.70	5.54	5.83	5.49	5.73	5.72	3.45	3.51	3.43	3.46	3.63	3.75	3.68	3.69
吸収前	25.27	26.60	25.52	25.43	19.05	18.41	18.44	18.33	14.52	16.38	16.39	16.76	16.28	16.62	16.42	16.47
吸収後	19.98	19.33	19.62	19.93	13.12	12.92	12.71	12.52	11.07	12.82	12.96	12.28	12.75	12.87	12.74	12.79
充填品重量(g)	—	—	—	—	3.71	3.69	3.67	3.69	—	—	—	—	0.68	0.73	0.71	0.70
吸収前	—	—	—	—	7.60	7.78	7.98	7.77	—	—	—	—	8.03	7.92	7.83	7.33
吸収後	—	—	—	—	3.89	7.01	7.20	7.08	—	—	—	—	7.34	7.22	7.12	7.28
汚れ吸収三不織布 重畳(g)	2.79	2.81	2.75	2.75	2.83	2.33	2.33	2.63	2.82	2.79	2.86	2.82	2.85	2.83	2.91	2.86
吸収前	2.83	2.65	2.76	2.76	2.83	2.33	2.59	2.63	11.35	9.95	9.75	10.35	2.85	2.89	2.91	2.96
吸収後	0.34	0.05	0.05	0	0	0	0	0	8.83	7.16	8.89	7.53	0.00	0.03	1.00	0.00
吸収量合計(%)	20.02	20.02	19.85	19.97	20.01	19.99	20.00	20.01	19.60	19.98	15.25	19.81	20.09	20.09	19.86	20.01
ナフキン吸収率(%)	99.86	99.75	99.85	99.80	65.57	64.63	63.55	64.53	56.48	54.16	65.29	61.98	63.46	54.05	64.15	63.89
本充填品吸収率(%)	—	—	—	—	34.43	35.37	36.45	35.42	—	—	—	—	31.54	35.85	35.11	35.11
性代率(%)	0.20	0.25	1.15	0.20	0.00	0.00	0.00	0.03	13.52	85.84	34.71	38.22	0.30	0.03	0.00	0.00
純糸數尾(mm)	58	57	55	51	—	71	74	78	58	39	61	60	—	77	76	78
ナフキンのみ 本充填品併用	—	—	—	—	76	—	—	—	—	—	—	—	76	69	—	78

In addition, the rayon staple was taken for the example and the relation between water-dispersion [ the / fiber length and water-dispersion ], and the generating condition of \*\*\*\* was tested again.

[0035] The dispersibility trial took 0.2g of samples in 2l. water, performed stirring for 100rpm and 5 minutes with the stirring type detergency test machine, it is a sieve (Mesh No.4), and it was dipped up and filtered, performed 105 degrees C and desiccation for 20 minutes, measured weight, and asked for dispersive power according to the degree type. The result is shown in a table 3. It turns out that dispersive power increases, so that fiber length is short.

[0036] Dispersive power (%) = (A-B)/Bx100A — The amount of samples B — The amount of mesh residuals [a table 3]

繊維長( mm )	分散率( % )
5	75. 0 3
10	59. 0 5
20	37. 2 0
25	31. 8 0
30	29. 4 6

After the \*\*\*\* omission trial put the product into the plastic bag with a chuck and shook it 30 times with the amplitude of 30cm, it observed \*\*\*\* which picks out a product from a plastic bag with a chuck, and remains. The result is shown in a table 4. It drains off the fiber length of 5mm or less, and \*\* is not mostly desirable.

[0037]

[A table 4]

繊維長(μm)	評価
5	ケバ多く気になる X
10	ややあるが気にならない △
15	ややあるが気にならない △
20	ややあるが気にならない △
25	あまりない ○
30	あまりない ○

From the result of the above-mentioned water-dispersion ones and a \*\*\* omission trial, 6mm or more 25mm or less can call fiber length 10mm or more 15mm or less desirable still more preferably in a rayon staple.

#### [0038]

[Effect of the Invention] The sanitary device for women concerning this invention a passage clear from the place explained in full detail above Are the three-dimensional small reliance member used assigning the vulva, and it has absorptivity ability good in itself. Also when it uses together with the outside and the napkin which fit processing of menstrual blood and other secrete also by independent use and there is much menstrual blood loss And at the time of a walk, at the time of movement, in the time of sleeping etc., space is not produced between a napkin and the vulva, and since absorption diffusion is carried out and it mediates between menstrual blood effective in a napkin, a horizontal leak and a back leak can be prevented effectively. Moreover, since it does not unite with the napkin, positioning to the vulva is easy at the time of wearing.

[0039] Moreover, since it has the tongue piece, at the time of wearing, it is sanitary at the time of desorption, and convenient the time, and since it has water collapsibility, since after use can be passed to a toilet, it has abandonment and the advantage of being easy. Moreover, [ whether the sheet-like core material of the absorptivity fiber which has water collapsibility is involved in in the shape of a rod, and a cylindrical absorber is constituted, and ] The laminating of the sheet-like core material of the absorptivity fiber which has water collapsibility is carried out on the auxiliary-seat material of the absorptivity fiber which has water collapsibility. According to the manufacturing method which involves in in the state of \*\*\*\*\*\*, constitutes a cylindrical absorber, attaches firmly the base of a package and the both-ends extra length portion of facing by the facing which has body fluid permeability and water collapsibility for the outside of this cylindrical absorber, and constitutes a tongue piece It is convenient to detach and attach and sanitary, and absorptivity ability can be good and can manufacture easily a sanitary device convenient also at the time of abandonment.

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[Translation done.]

\* NOTICES \*

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The perspective diagram showing one example of the sanitary device for women concerning this invention

[Drawing 2] This front view

[Drawing 3] This side elevation

[Drawing 4] This central drawing of longitudinal section

[Drawing 5] The outline perspective diagram showing the operation condition of a menstrual blood absorptivity ability trial of this sanitary device

[Description of Notations]

- 1 .... Cylindrical absorber 1a .. Sheet-like core material
- 1b .... Auxiliary-seat material 2 .. Facing 3 .. Tongue piece
- 4 .... Base 5 .. Acrylic board 6 .. Napkin
- 7 .... Buret 8 .. Nonwoven fabric for leak absorption (kino crossing)
- A .... Sanitary device

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[Translation done.]

\* NOTICES \*

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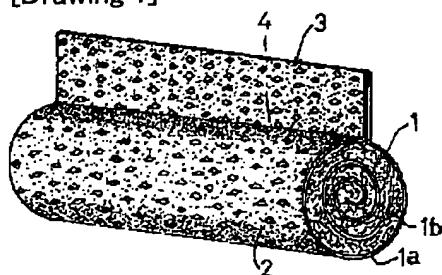
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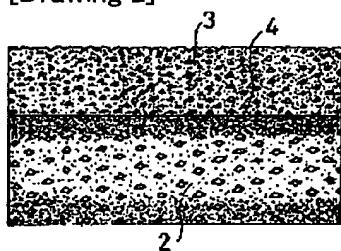
## DRAWINGS

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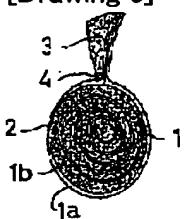
[Drawing 1]



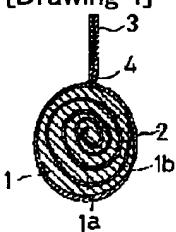
[Drawing 2]



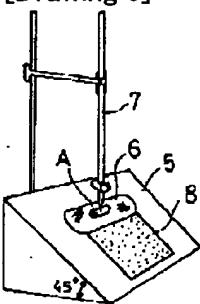
[Drawing 3]



[Drawing 4]



[Drawing 5]



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[Translation done.]